Sleep Disruption in Patients with Cancer

13th Biennial Phyllis J. Verhonick Nursing Research Course

Stacey Young-McCaughan, Mary Z. Mays, Sonya M. Arzola, Linda H. Yoder, Stacey A. Dramiga, Kenneth M. Leclerc, John R. Caton, Jr., Robert L. Sheffler & Marilyn U. Nowlin

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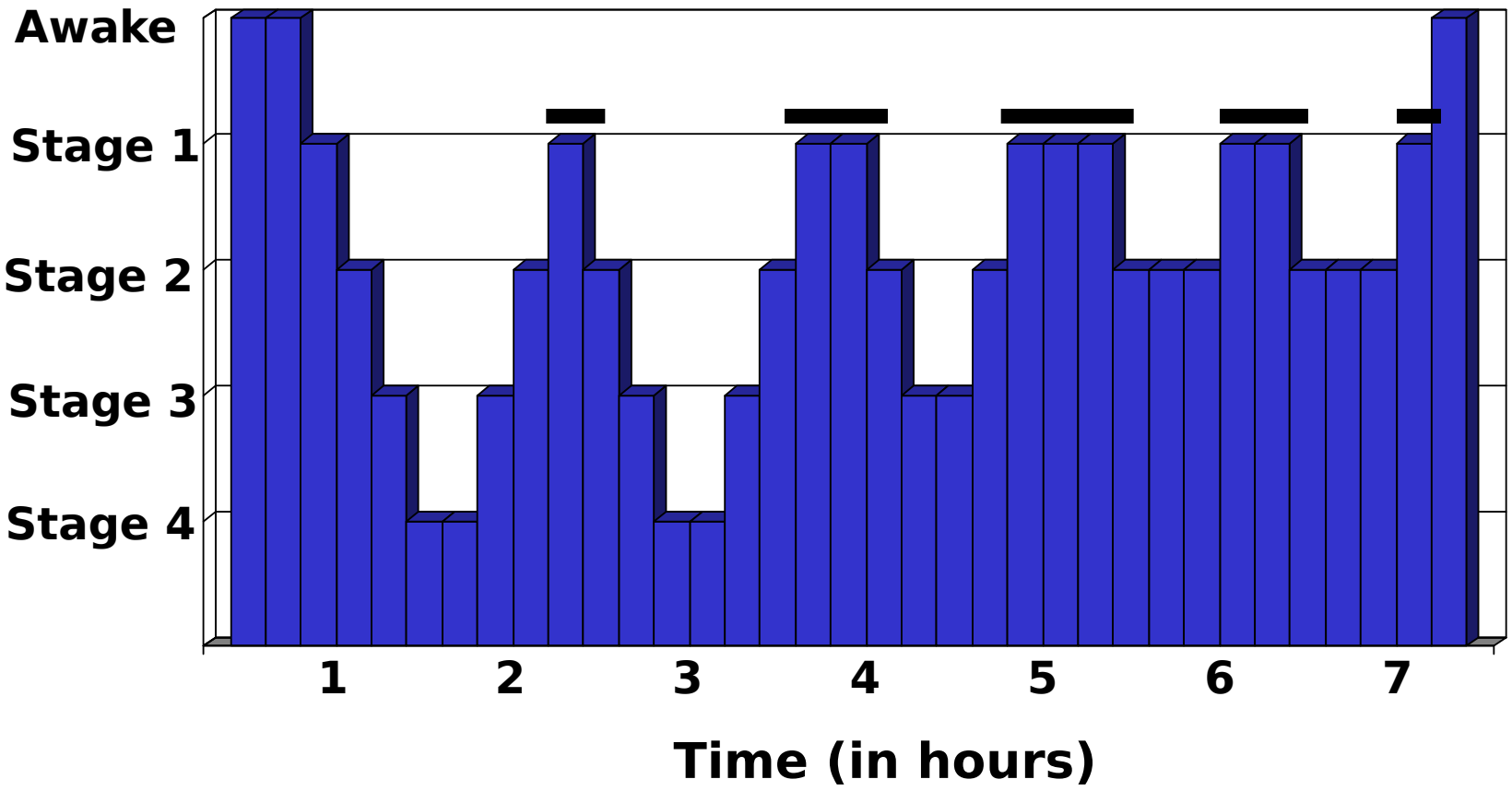
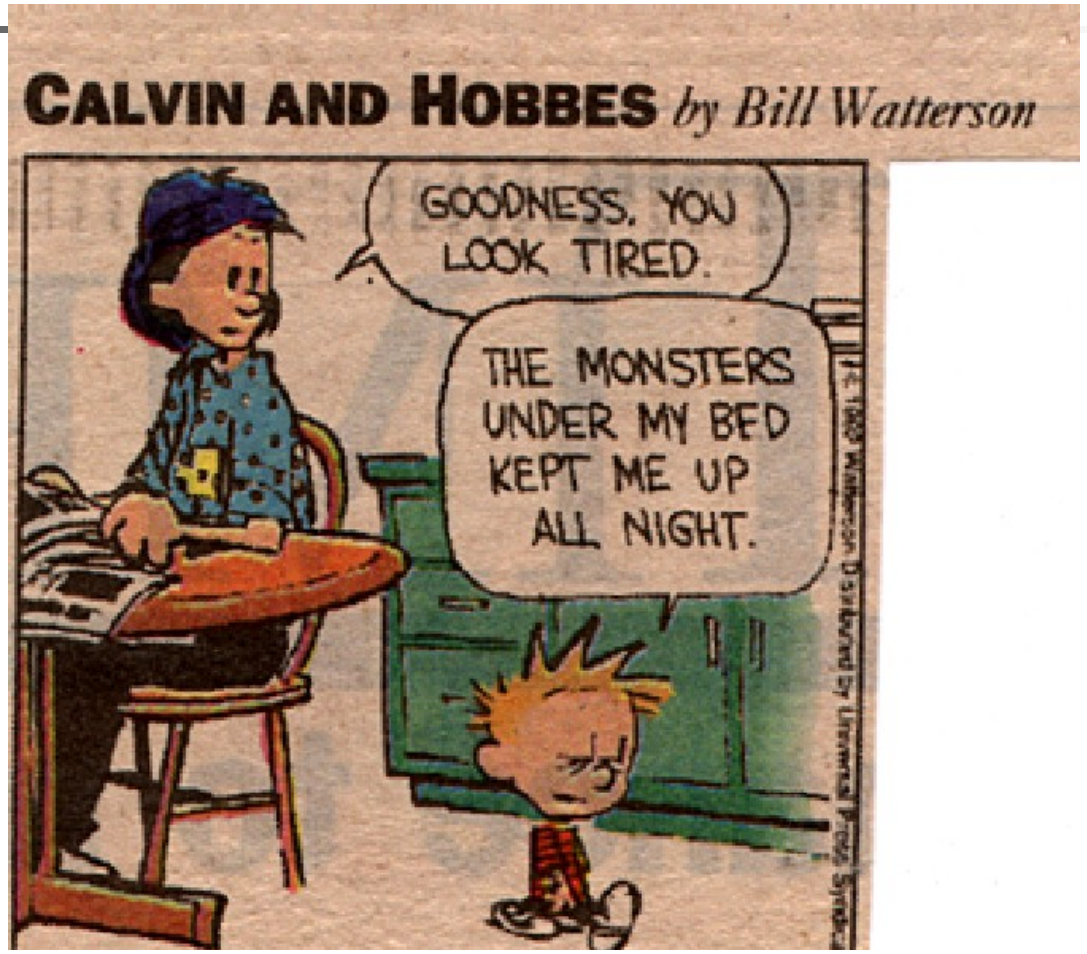
Characteristics of Sleep

- **Naturally-occurring circadian behavior**
- **Restorative process**
- **5 distinct stages of sleep**

Stages of Sleep




CALVIN AND HOBBES by Bill Watterson
GOODNESS. YOU LOOK TIRED.
THE MONSTERS UNDER MY BED KEPT ME UP ALL NIGHT.

Sleep Disruption in Patients with Cancer

- **Between 44% and 75% of patients experience difficulty sleeping** **(Andrykowski, et al., 1997; Derrogatis et al., 1979; Engstrom, Strohl, Rose, Lewandowski, & Stefanek, 1999; Miaskowski & Lee, 1999)**

- **The effects of daytime inactivity and nighttime awakenings have been associated with higher cancer-related fatigue (Berger, 1998; Berger & Farr, 1999; Berger & Higginbotham, 2000)**

Effects of Exercise Upon Sleep in the General Population

- **Generally improved objective measures of sleep with exercise ***
- **Considerations**
  - **Sleep assessment (one-time assessment, laboratory setting, EEG evaluation, no subjective measures)**
  - **Subject demographics (age, baseline sleep quality, experience with exercise)**
  - **Duration, intensity & timing of exercise**

* Horne, 1981; Torsvall, 1981; Youngstedt, O'Connor & Dishman, 1

Testing an Exercise Intervention in Patients with Cancer

- **Purpose:** To investigate the feasibility of an exercise intervention program patterned after an existing Phase II Cardiac Rehabilitation Program to positively influence physiological and psychological parameters of health in patients with cancer
- **Design:** Repeated measures
- **Setting:** Two military medical centers in southwest U.S.
- **Sample:** Patients within 2 years of a cancer diagnosis

Testing an Exercise Intervention in Patients with Cancer

- **12-week, Phase II Cardiac Rehabilitation Program**
  - **Supervised exercise program**
  - **Education**
- **Outcome Measures**
  - **Exercise tolerance as measured with maximal graded exercise testing**
  - **QOL as measured with the CARES-SF**
  - **Activity and rest patterns as measured with wrist actigraphy**

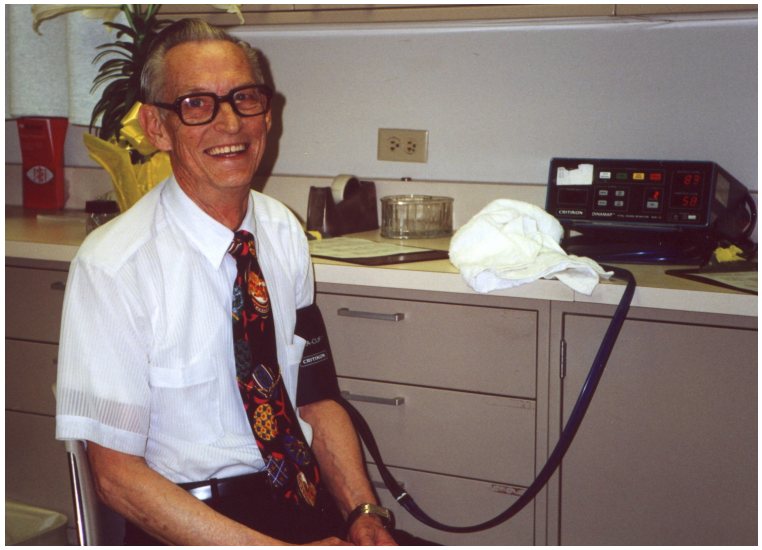
Desirable Characteristics of Sleep Measures

- **Non-obtrusive measurement**
- **Ability to assess both sleep and activity over time**
- **Appreciation of fluctuating rhythm**

Demographics (n = 62)

- Age 24 – 83 (mean = 59)
- 50% men and 50% women
- Almost 30% minorities
- All education levels
- 50% retired, 50% working part-time or full-time

Cancer History (n = 62)

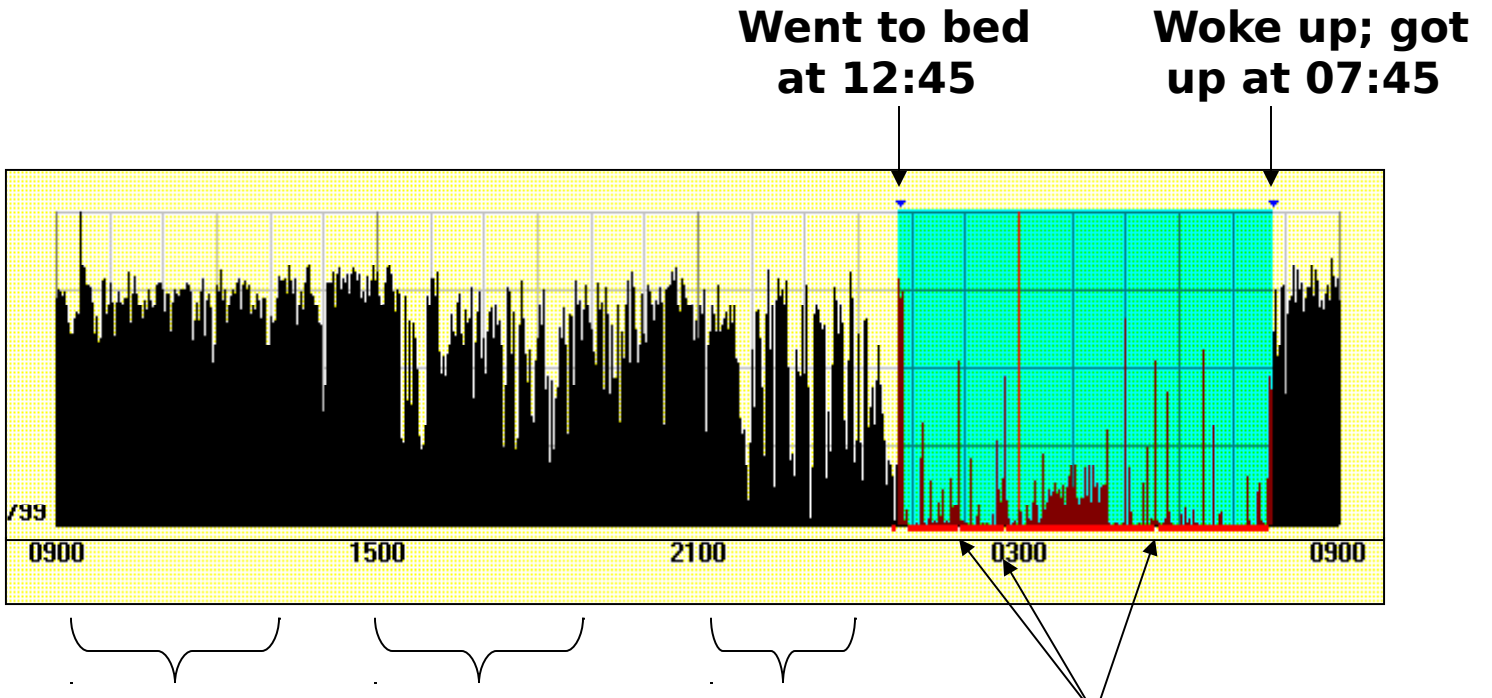


- **Wide range of cancer diagnoses**
- **All stages of disease**
- **25% undergoing treatment when enrolled into study**

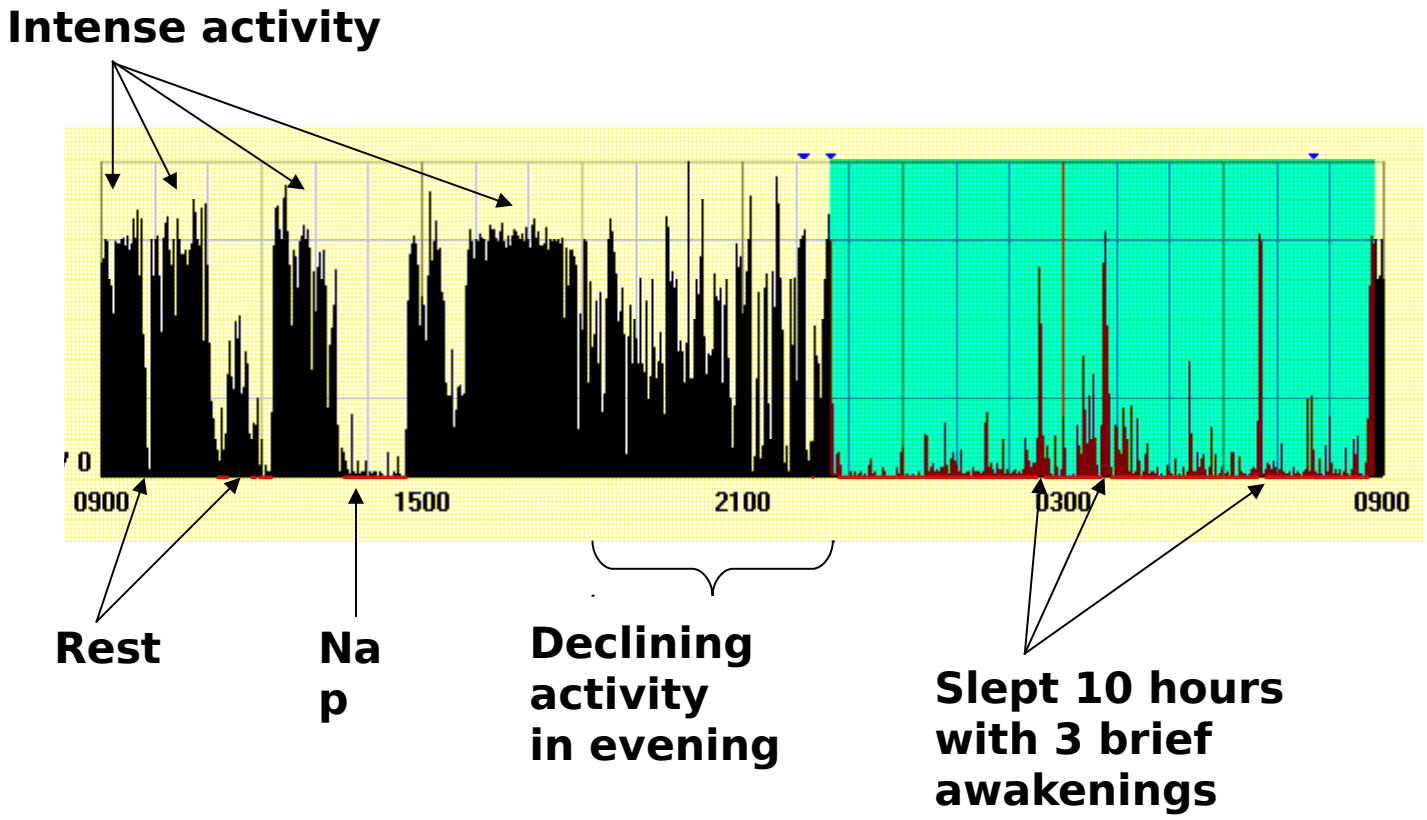
Sleep Patterns at Baseline (n = 55)

Sleep Characteristic	Normal	Study Participants
Duration of Sleep	7-9 hours	6 hours
Percent of Night Spent Sleeping	95%	77%
Number of Nighttime Awakenings	2-6 times	13 times
Sleep Episode Length	90-120 minutes	49 minutes

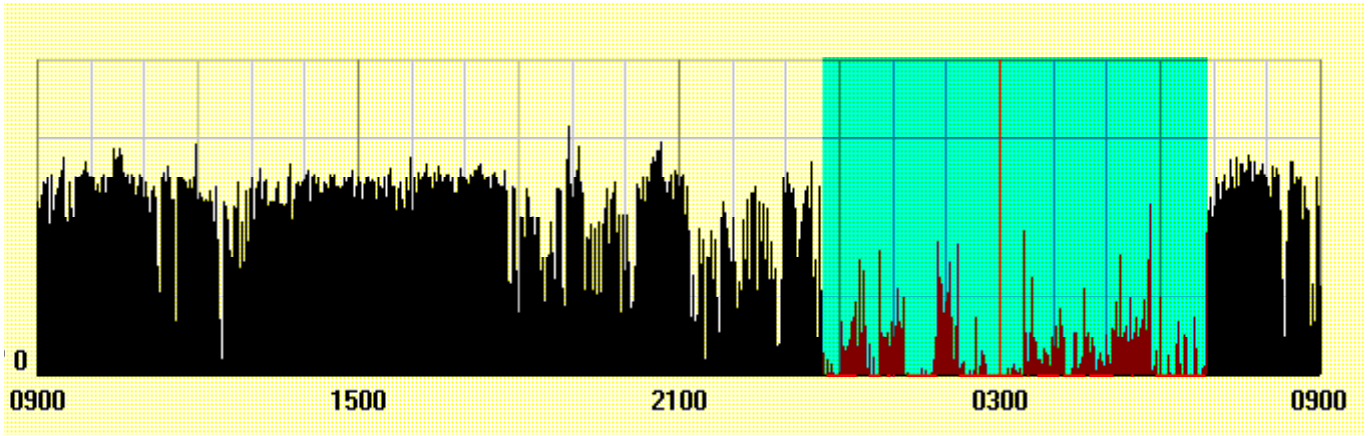
Typical Circadian Rhythm



Example of Compromised Daytime Activity



Example of Sleep Fragmentation



Intense activity in morning

Intense activity in afternoon

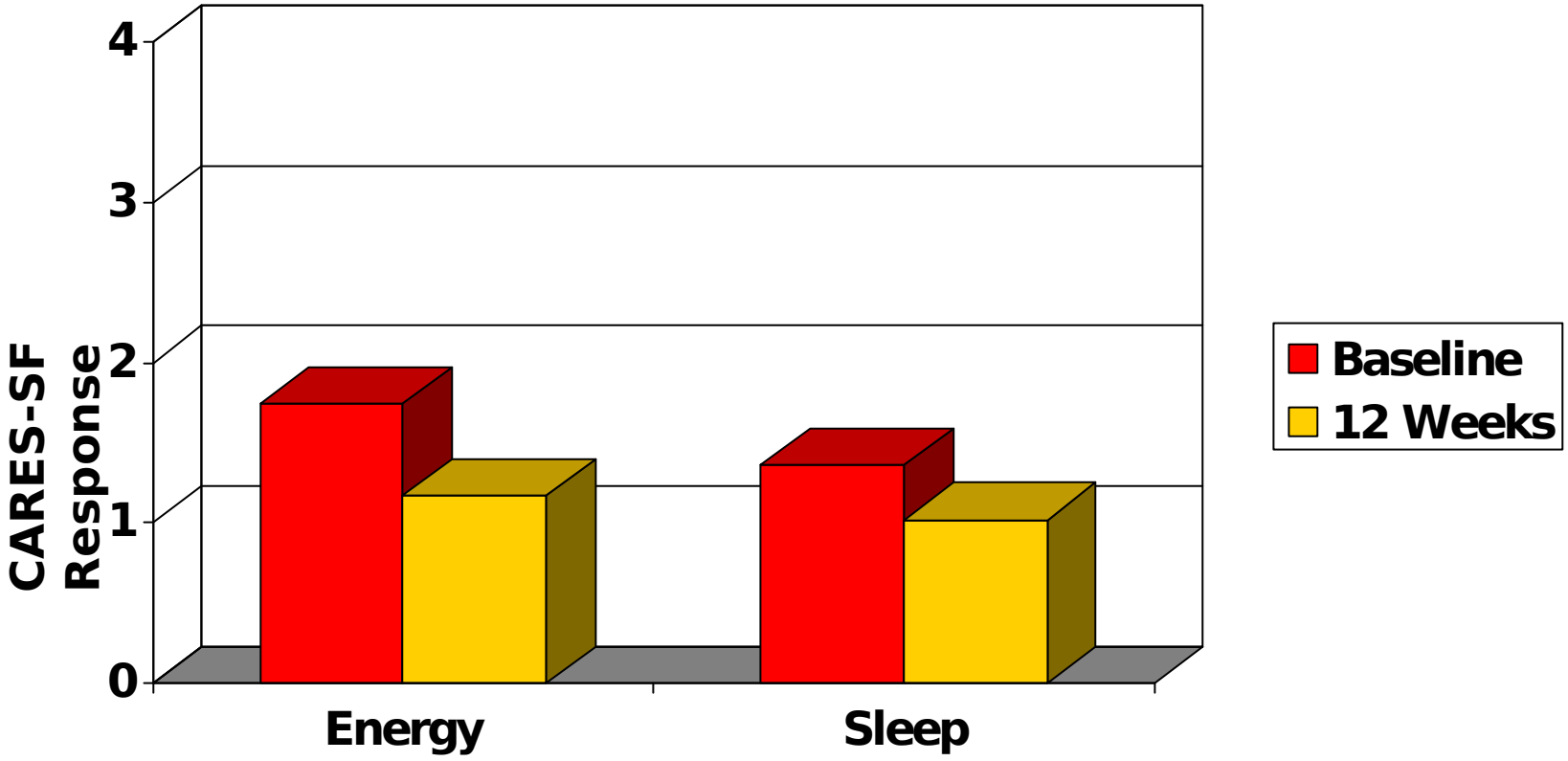
Declining activity in evening

Slept 7 hours with 16 awakenings lasting between 10 & 40 minutes

Sleep Patterns with Exercise
(n=31-34)

- **No change in:**
  - **Duration of sleep**
  - **Percent of night spent sleeping**
  - **Number of nighttime awakenings**
  - **Sleep length**
- **Improvements in:**
  - **Self-reported measures of sleep**

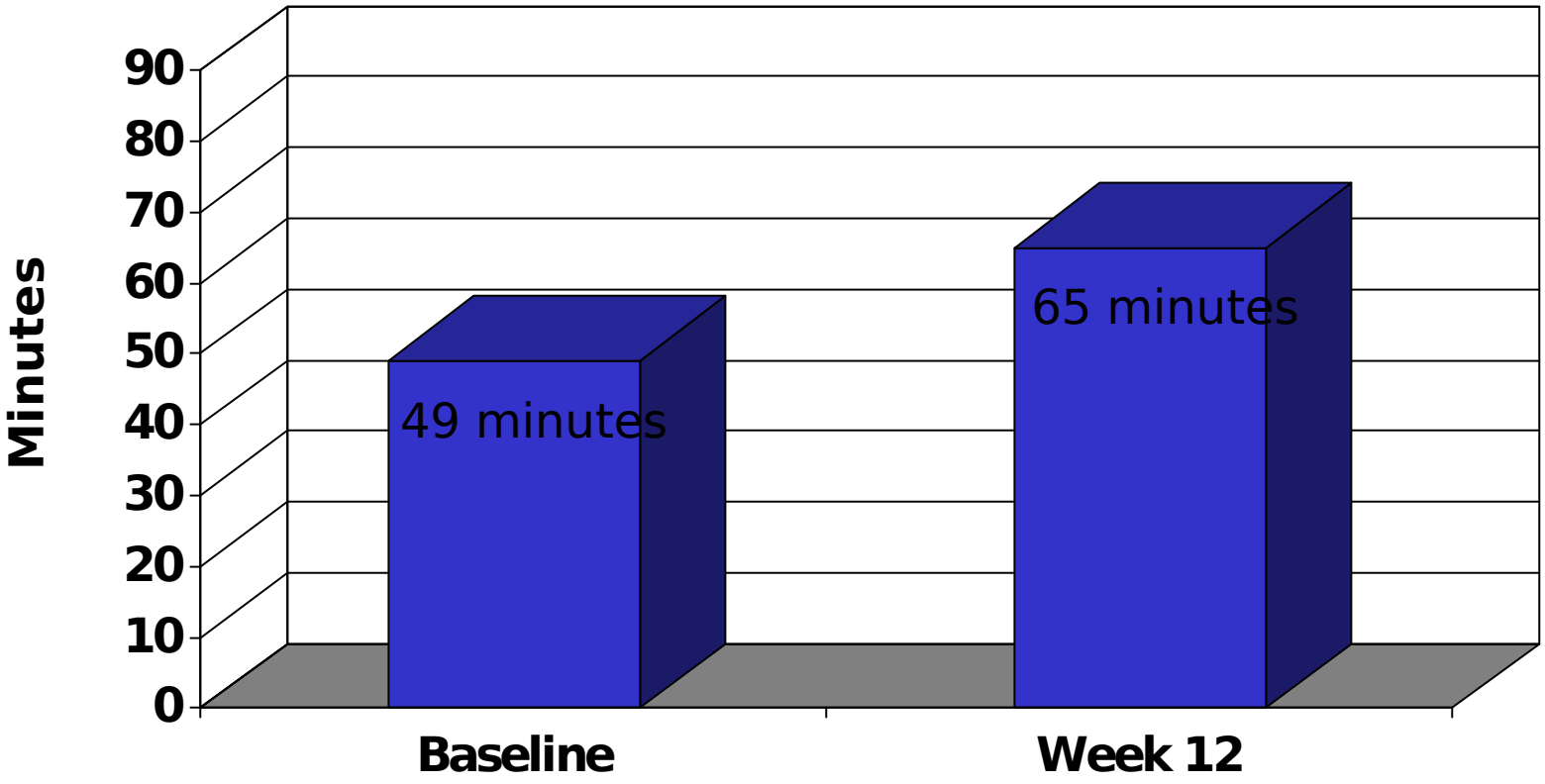
Self-Reported Measures (n = 42)



Lower scores indicate more energy and less difficulty sleeping, p

Sleep Episode Length (n = 34)

(normal sleep episode length = 90 minutes)

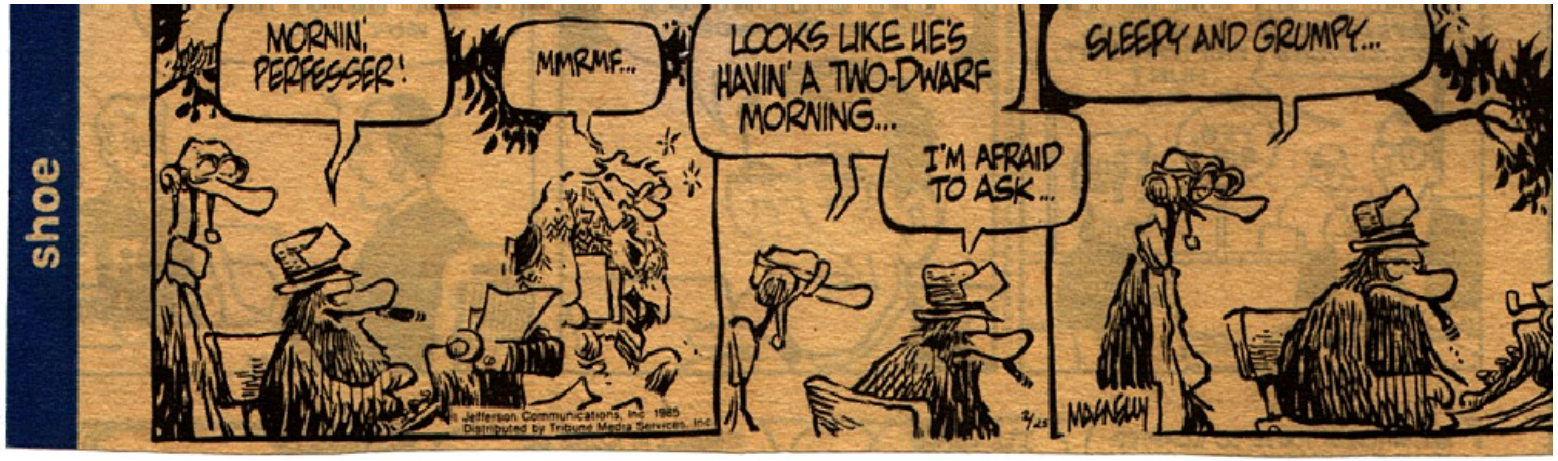


Conclusions

- **Patients with cancer experience sleep disruption**
- **Improvements in subjective sleep measures with exercise**

Challenges of Sleep Research

- **Linking subjective experiences with objective observations**
- **Clinical importance of various sleep measures**
- **Detecting change within a circadian pattern**
- **Relationship between sleep and fatigue in patients with cancer**



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